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RTCA

RTCA, Inc.
1140 Connecticut Avenue, N. W., Suite 1020
Washington, D. C. 20036

Telephone 202-833-9339
Facsimile 202-833-9434

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June 17, 1999

Ms. Magalie Roman Salas
Office of the Secretary
Federal Communications Commission
The Portals
445 Twelfth Street, S.W., Room TW-A325
Washington, D.C. 20554

Dear Ms. Salas:

RTCA, Inc. submits the enclosed comments in the matter of FCC 99-37, IB Docket No. 99-67, RM No. 9165.

While RTCA concurs with most of the terms of the proposed rulemaking, there are a number of concerns about the emission limits being proposed. RTCA Special Committee 159 - Global Positioning System reviewed the FCC docket, endorsed the enclosed comments and stands ready to provide further information on these issues.

Sincerely,

David S. Watrous
President

Encls:
a/s

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BEFORE THE

Federal Communications Commission

WASHINGTON, D.C. 20554

JUN 18 1999

In the Matter of	)	
	)	
Amendment of Parts 2 and 25 to Implement the Global Mobile Personal Communications by Satellite ("GMPCS") Memorandum of Understanding and Arrangements	)	IB Docket No. 99-67
	)	
Petition of the National Telecommunications and Information Administration to Amend Part 25 of the Commission's Rules to Establish Emissions Limits for Mobile and Portable Earth Stations Operating in the 1610-1660.5 MHz Band	)	RM No. 9165

To: The Commission

COMMENTS OF RTCA

SUMMARY

RTCA Special Committee 159 has reviewed the subject Federal Communications Commission (FCC) docket. RTCA, Inc., on the basis of that review, is concerned that the emission limits prescribed to protect the Global Navigation Satellite System (GNSS) from harmful interference will be applied in the future to additional emitters which were, in fact, not considered when these limits were established. Protection of public safety requires that newly proposed systems should be examined on a case by case basis to ensure that the aggregate interference does not exceed the GNSS interference threshold.

INTRODUCTION

RTCA functions as a Federal Advisory Committee, dealing with aeronautical navigation, communications, and other safety-related issues. RTCA's membership includes airline representatives, equipment manufacturers, aeronautical research and development firms, government representatives, and users of aviation equipment. Thus the organization has a long-standing and continuing interest in promoting and preserving aviation safety. Furthermore, RTCA Special Committee 159 (SC 159) developed an important source document, RTCA/DO-235[1], which established the foundation for the broadband noise limits cited in FCC 99-37.

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[1] *See* "Assessment of Radio Frequency Interference Relevant to the GNSS," Document No. RTCA/DO-235 (January 27,1997).

DISCUSSION

The aviation community via RTCA takes no issue with most of the terms of the proposed rulemaking developed by the Federal Communications Commission as embodied in this document. However, RTCA has a number of concerns about the emission limits being proposed. Based on its on-going review of the effects of interference on GNSS, RTCA recommends the following:

A. Application of Limits. For mobile earth stations (MESs) operating in the 1626.5-1660.5 MHz band, emission limits of -70 dBW/MHz for broadband interference and -80 dBW for narrow-band interference should apply to the entire band 1559-1605 MHz. No grandfathering or other exceptions should be granted over specific time periods for any systems using any portions of this spectrum.

B. Single Emitter Assumption. The RTCA was asked by the Federal Communications Commission (FCC), National Telecommunications and Information Administration (NTIA), and the Federal Aviation Administration (FAA) to develop limits on the emissions from so-called "Big LEO" MSS MET's, which transmit in the band 1610-1626.5 MHz, that would protect the emerging GNSS in the adjacent 1559-1610 MHz band. As a result, the aviation community, through RTCA SC 159, and with consultation with the MSS community, proposed the limits of –70 dBW/MHz (broadband) and –80 dBW (narrowband) e.i.r.p over the 1559-1605 MHz band as the limits which will protect the GNSS receivers under a specific agreed-to scenario. One of the most important elements of this scenario was the assumption that there would be only one interfering emitter at any given time close to an aircraft on final approach (i.e., about 100 feet). Because of this assumption, and because of the intense pressure from the MSS community to keep the limits as high as possible, the entire GNSS interference budget was allocated to this one MSS interference source in the threat zone.

C. Proliferation of Emitters. However, the environment of sources of potential interference to GNSS is expanding, bringing the danger that these limits, namely –70 dBW/MHz and –80 dBW, will be applied to other potential interference sources without adequate study or justification. As the number of potentially offending emitters increases, there will be an unacceptably high probability that more than one emitter will be present, and simultaneously transmitting, within the threat zone. If this happens, the allowable GNSS interference threshold will be exceeded, and the navigation accuracy will degrade outside its specified requirements. For this reason, the –70 dBW/MHz and –80 dBW e.i.r.p. limits should not be used (see D below) as a universal standard for other emitters, either existing, planned or future[2].

D. Limits to Protect Against Multiple Emitters. To account for the cumulative effect of additional emitters, RTCA recommends that the aggregate emission level from all anticipated

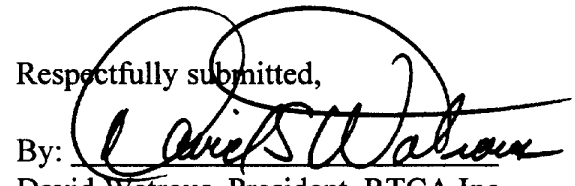
[2] See also ITU-R Draft New Recommendation ITU-R M.[RNSS.CHAR], 27 April 99, page 2, note 1, which states: "The maximum unwanted emission levels for the band 1559-1610 MHz stated in Recommendation ITU-R M.1343 have been developed pursuant to a specific interference scenario, and are not intended to be applied to stations of any service other than MSS MESs operating in the 1-3 GHz range without further study."

new services (i.e., other than MSS services in the 1610-1660 MHz band) should be at least 10 dB below the MSS levels, i.e., –80 dBW/MHz and –90 dBW (narrowband) e.i.r.p. Proposals for new systems and expanded services should demonstrate compliance to the aggregate emission level on a case by case basis.

E. Improved Susceptibility and Mitigation. Paragraph 76 calls for "evidence that the susceptibility of GNSS receivers could be significantly reduced from the level assumed in the susceptibility analysis in Appendix F of the RTCA/DO-235 report at little additional cost or impairment of performance". Since DO-235 was issued in January of 1997, manufacturers and others have expended a considerable amount of effort to address this issue. However, the studies have shown that the accuracy, integrity, continuity, and availability requirements are so stringent that higher noise floors can not be accommodated. Furthermore, interference mitigation techniques are typically effective only against relatively high power and/or narrowband interference signals. They have not been shown to be robust enough for civil aviation, and come at a high cost. Most important, none of those techniques has been shown to be effective against the kind of low-level broadband noise that additional RFI sources would most likely generate.

RTCA stands ready to provide further inputs on these issues.

Respectfully submitted,

By: 

David Watrous, President, RTCA Inc.

1140 Connecticut Ave. NW, Suite 1020
Washington, D.C.
(202) 833-9339

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